

We claim:

- 1           1.       A method for antenna tracking, comprising:  
2           determining complex weightings for matching a polarization of an incident signal on  
3 a data channel; and  
4           applying the complex weightings to a tracking channel such that an antenna system  
5 polarization is matched to the polarization of the incident signal.
- 1           2.       The method for antenna tracking of claim 1, wherein the complex weightings  
2 are determined such that a signal power of the incident signal is maximized.
- 1           3.       A method for antenna tracking, comprising:  
2           deriving complex weighting values that match a polarization of an incident signal on  
3 a data channel; and  
4           applying the complex weighting values and time variations of the complex weighting  
5 values to a tracking channel to replicate the polarization of the incident signal over time.
- 1           4.       A system for antenna tracking, comprising:  
2           means for measuring a polarization of an incident signal on a data channel and for  
3 determining an amplitude and phase combination that matches the polarization; and  
4           means for applying the amplitude and phase combination to a tracking channel  
5 responding to variations in the polarization.
- 1           5.       The system for antenna tracking of claim 4, wherein the means for measuring  
2 a polarization of an incident signal on a data channel and for determining an amplitude and  
3 phase combination that matches the polarization includes  
4           a polarization-matching network.
- 1           6.       The system for antenna tracking of claim 5, wherein the polarization  
2 matching network includes a vector modulator.

1           7.     The system for antenna tracking of claim 5, wherein the polarization  
2 matching network includes a diversity combiner.

1           8.     The system for antenna tracking of claim 4, wherein the means for applying  
2 the amplitude and phase combination to a tracking channel responding to variations in the  
3 polarization includes  
4           a polarization-matching network.

1           9.     The system for antenna tracking of claim 8, wherein the polarization  
2 matching network includes a vector modulator.

1           10.    The system for antenna tracking of claim 8, wherein the polarization  
2 matching network includes a diversity combiner.

1           11.    A method for antenna tracking, comprising:  
2           processing orthogonally polarized tracking channel components of an incident signal  
3 to make a determination as to which of the orthogonally polarized tracking channel  
4 components is stronger; and  
5           using the determination to select a polarization of a data channel to reduce a  
6 polarization mismatch loss.

1           12.    A method for antenna tracking, comprising:  
2           determining which of two orthogonal polarization components of an incident signal  
3 is a stronger signal component;  
4           determining a polarization mismatch loss for two orthogonal polarization  
5 components;  
6           weighing a tracking response amplitude by the polarization mismatch loss; and  
7           selecting a polarization of a data channel depending upon the stronger signal  
8 component.

1           13.     A system for antenna tracking, comprising:  
2           means for detecting orthogonally polarized signals of a tracking channel, determining  
3     which of the orthogonally polarized signals is stronger, and suppressing a cross polarization  
4     response of the tracking channel; and  
5           a controller configured to select a polarization of a data channel depending upon  
6     which of the orthogonally polarized signals is stronger.

1           14.     The system for antenna tracking of claim 13, wherein the means for detecting  
2     orthogonally polarized signals of a tracking channel, determining which of the orthogonally  
3     polarized signals is stronger, and suppressing a cross polarization response of the tracking  
4     channel includes  
5           means for combining the orthogonally polarized signals after the orthogonally  
6     polarized signals are detected.

1           15.     The system for antenna tracking of claim 13, wherein the means for detecting  
2     orthogonally polarized signals of a tracking channel, determining which of the orthogonally  
3     polarized signals is stronger, and suppressing a cross polarization response of the tracking  
4     channel includes  
5           two tracking receivers configured for detecting the orthogonally polarized signals,  
6     respectively, and  
7           means for matching tracking amplitude responses of the two tracking receivers.

1           16.     The system for antenna tracking of claim 13, wherein the means for detecting  
2     orthogonally polarized signals of a tracking channel, determining which of the orthogonally  
3     polarized signals is stronger, and suppressing a cross polarization response of the tracking  
4     channel includes  
5           a tracking receiver configured to switch between tracking channel inputs for the  
6     orthogonally polarized signals and to generate sequential outputs, and  
7           a sequential summer configured to receive the sequential outputs and to generate a  
8     summed output that is weighed by a polarization mismatch loss of the orthogonally  
9     polarized signals.